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ABSTRACT

As part of the final report by the Arizona Board of Regents' Task Force on Excellence, Efficiency and Competitiveness, a discussion of the numbers available to predict teacher supply and projected student enrollment is presented with an examination of Arizona's professional education programs and how they are meeting the needs. A discussion of teacher supply and demand in the 1990's focuses on: retirement statistics; the projected need for teachers; the need for minority teachers; the effect of the Pre-Professional Skills Test examination; the need for teachers in rural Arizona; the need for teachers in specific disciplines; other routes to certification; post-baccalaureate programs; alternate certification; and data needs. Professional education of teachers in Arizona is presented as: the 5-year education program; pilot programs; additional classroom training; and the need for working partnerships. some of the conclusions are that the composition of the student body will change significantly, Arizona will have a continuing demand for teachers through the 1990's if the current teacher-student ratio is maintained, and experimentation and research on teaching and teacher preparation are needed. Six recommendations include: develop a program to recruit minorities into the teaching profession; develop pilot programs in such areas as beginning teacher induction and delivery of education in remote areas; and develop standards that make the colleges of education accountable for the performances of their graduates. Contains over 100 references. (SM)

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TEACHER SUPPLY AND DEMAND IN THE 1990'S and PROFESSIONAL EDUCATION OF TEACHERS

ESTHER SHERBERG

The quality of K-12 education in Arizona is a statewide concern. In meetings held by the Task Force staff, it emerged as a crucial area of consideration for the future development of the state. University faculty and staff, university recruiters and outside employers emphasized the need for an effective school system to provide well-prepared students, attract skilled employees to the state, and enhance the quality of life. The concern centers on the question of whether there will be a sufficient number of adequately qualified teachers to staff the public schools in the next decade. The issues of quantity and quality of teachers are primary in assessing the needs of the schools. These issues are both separate and highly interrelated. This paper will look at the numbers that are available to predict teacher supply and projected student enrollment and then will examine the professional education programs in the state and how these are meeting the needs.

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TEACHER SUPPLY AND DEMAND IN THE 1990's

Retirement Statistics

The teacher population throughout the country is aging; this has led to widespread predictions of teacher shortages within the next decade. A statewide age breakdown for Arizona's teachers is not available. The records kept by individual school districts show that the age figures vary among the districts. Of members of the Arizona Education Association (approximately 65 percent of Arizona's K-12 teachers), 23 percent are over 50 years of age. As further examples, in the Tucson Unified School District, 27 percent of the teachers are over 50 (of these, 7 percent are over 60); but in the Mesa School District, only 12 percent of the teachers are over 50, with 1.5 percent over 60. Thus, on average, planners should consider that 20 to 25 percent of the teachers will retire within the next 15 years and about five percent within the next two to five years. Information should be collected, statewide, that shows the geographical areas where the retirements will occur and the teaching disciplines that will be affected.

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Projected Need for Teachers

The teachers who are approaching retirement age, predominantly women, entered the work force when there were few career paths available to women, and teaching was a primary choice. During the span of their careers, the sharp shift in opportunities for women has resulted in many fewer seeking to become teachers. Other perceptions of teaching, such as low salaries, poor working conditions and lack of professional prestige, have contributed to the decline, until recently, in the number of students seeking to enter the elementary and secondary teacher education programs. The result is that the number of people graduating from the Arizona universities with degrees in education is small compared to the projected needs of the state. For example, preliminary figures compiled from statistics from the three public universities and Grand Canyon University show that during the 1987-88 academic year there were 1,681 students serving as apprentice teachers, a last step before graduation and certification. This is an increase of only 55 students from 1986-87. In Fall, 1988, it is predicted that 3,141 teaching positions will be available in Arizona, an increase of 195 more available positions than in Fall, 1987. Thus, in the past year, the balance between the number of newly prepared teachers from the Arizona universities and the projected need in the public schools has dropped 1.7 percent to 53.5 percent.

The number of students serving in apprentice positions in the public schools has been used as the benchmark figure in determining teacher supply, but it can be misleading. In 1986, teachers seeking first-time certification passed the Arizona Teacher Proficiency Examination at the rate of 70.3 percent. Therefore, not all of the newly degreed teachers were able, immediately following graduation, to assume a teaching position. Figures are not yet available to show whether the first-time pass rate has improved since the adoption of the Pre-Professional Skills Test as a prerequisite for entry into the colleges of education.

The annual figures on number of apprentice teachers and projected available positions are compiled by the Career Services Division of ASU. No breakdown is provided that shows where the available teaching positions are located. It has been the practice of graduating students to remain in the areas surrounding the universities. For 1988-89, however, there are fewer opportunities in Pima County, for example, for new UA graduates. The failure of a budget override proposal has limited a major district's (Tucson Unified School District) ability to hire new teachers. Under these circumstances, unless the UA graduates who are seeking positions in Pima County are able to relocate to other areas of the state, they may find little opportunity to teach this year. If any of these people are placebound, they will be lost to the teaching pool, at least temporarily.

Since the Arizona universities have been preparing only about one-half of the teachers needed, the state has depended upon in-migrants to fill the remaining positions. This pattern is not unusual in the western states, where the number of in-migrants as a percentage of the total supply of new teachers ranges from 26 percent (Utah) to 89 percent (Alaska). If the colleges of education maintain their present enrollment patterns, the state will continue to depend heavily upon in-

migrants and, if the rate of migration into Arizona slows, will be in direct competition with other sunbelt states for qualified new teachers. Teacher retirements throughout the U.S. will open positions in many areas; this may contribute to a decline in in-migrant teachers. Arizona will have to become more aggressive in recruiting teachers from other parts of the U.S., especially in selected disciplines, such as bilingual education, and for specific geographic areas of the state.

Need for Minority Teachers

If we can be assured that a steady stream of in-migrants will follow the lure of the good life that Arizona offers, is there a reason to be concerned about the imbalance between teachers from Arizona and those from out-of-state? The higher figures on first-time pass rates for certification by out-of-state applicants might indicate that the new residents are older and more experienced teachers. It might also indicate, based on demographic data, that the new teachers are predominantly White. Therefore, while dependence on in-migrants puts qualified teachers into the classroom, these people may not be familiar with the cultural backgrounds of the students and their hiring does not help to balance the ethnic makeup of the teachers with that of the students. It might be necessary to require some special training requirements for teachers new to the state during the first year or two of their employment to provide experience in the education of children who come from minority backgrounds or whose lives have been materially affected by poverty.

At present, 40 percent of children in Arizona under four years of age are ethnic minorities. The ethnic composition of the student body in the coming decade will change significantly, and the ethnic makeup of the teachers should also change to more closely match that of the projected school population. Minority students need teachers who are bilingual and who can help reduce the likelihood of their dropping out of school. Recent studies indicate that there is a correlation between the dropout rate of minority students and the degree of sensitivity in ethnicity of their teachers. All students, majority and minority, need to be familiar with authority figures from different ethnic groups. The cross-cultural experience will be seriously limited unless more minority teachers become available.

At a time when the population of minority students is growing, that of minority teachers is not. In 1982, 11.6 percent of the teachers in Arizona were minorities; in 1987-88, when approximately 20 percent of the general population were ethnic minorities, the number of minority teachers remained at 11.2 percent.[1] During this period, minorities did not move into teaching in proportion to their numbers in the population. Whereas teaching had been a career of choice for minority men and women in the past, as with White women their opportunities broadened and better-paying, more prestigious jobs became available. The minority teachers who entered teaching in the 1950's are now approaching retirement and the search for their replacements has many states scrambling to recruit new minority teachers, both as students in the education programs and through alternate paths. Twenty-seven states presently have either task forces that are studying minority recruitment or programs in place to implement such recruitment. We cannot depend upon in-migration to fill the gap in Arizona, since

not enough minority teachers from other regions of the country are moving here at present. As competition for minority teachers increases across the country, it is not likely that we will attract them in significant numbers.

What means do we have, then, to prepare more minority teachers for our classrooms? In the period between 1982 and 1987, when minority representation in the teaching pool was already beginning to decline, the state imposed new criteria for entrance into professional education programs that have had a disproportionate and seriously negative effect on minority candidates. In Arizona, minority enrollments in the colleges of education began dropping just before the 1984 legislative mandate that all applicants for admission to the public colleges of education must pass a basic skills test in mathematics, reading and grammar. As the appropriate instrument, the Board of Regents chose the Pre-Professional Skills Test. Before this time, graduates of the teacher programs had to pass the Arizona Teacher Proficiency Examination as part of the certification process. The ATPE consists of a three-part basic skills section and a professional knowledge section. (All candidates for certification are still required to pass the Professional Knowledge component of the ATPE.) The figures cited earlier in this paper pertaining to first-time pass rates for certification refer to the ATPE. In 1986, the pass rate for Whites taking the ATPE basic skills section was 81.8 percent, falling to 60.7 percent for Hispanics, 39.6 percent for Blacks and 35.1 percent for American Indians, indicating perhaps a lack of experience in preparing for such examinations. The new teachers entering the classrooms in 1986, thus, were overwhelmingly White.

Effect of the PPST Examination:

The shift to use of the PPST as an entrance requirement has not changed the makeup of the student teachers; rather, it has had a major negative effect on minority applicants. Figures compiled by the Regents' staff for 1985-87 show that 59 percent of all first-time takers of the PPST passed all three sections (mathematics, reading, writing); but the pass rate for Blacks was 25.9 percent, for Hispanics 38.4 percent and for American Indians, 9.8 percent, significantly below the figures compiled for the ATPE. The pass rates improved on a second attempt at the test, but an average of only 60 percent tried again, and only 37 percent of the American Indian candidates did so. Therefore, the number of successful minority applicants to the colleges of education has dropped, and it is possible that the requirement of passing the PPST is deterring minority students from even attempting to apply for admission, particularly given that other career paths are available. Complete results are not yet available to show whether remedial outreach programs initiated by the colleges of education have made a difference in test scores.

A study of the PPST was carried out in 1985 by a group of educators convened by the Board of Regents. The purpose of the study was to determine the content validity of the three components and to establish reasonable passing scores. This panel found that a large majority of the items on each of the multiple choice tests were relevant and that applicants would have had an opportunity to acquire the knowledge or skill required. The few questions that were cited for potential bias were eliminated from the test.

Presently five other states (Nebraska, Nevada, Tennessee, Texas and West Virginia) use the PPST to test for admission to professional education programs. Wisconsin will initiate use of the test in 1989. In Arizona, the passing grades set for the three sections of the PPST reflect one error unit below minimum standard (three points); that is, Math--172, Reading--173, Writing--174. These grades are higher than those in effect in the other states. Texas grades at one point below in each section; the other states vary by one to three points in Math, one to four points in Reading and two to four points in Writing. In a validation study in Nevada, using grades of 169 in Reading and Math and 170 in Writing, the pass rate was 95 percent.

A bill introduced in the Arizona Legislature this past year provided for a four-year pilot program during which a percentage of students could be admitted to education programs if they passed one section of the PPST exam and had scores for each of the other two sections not more than three points below the passing score. This bill passed both the House and Senate Education Committees and was passed by the full House; it failed by two votes in the Senate. If the measure had passed, the grades would reflect more closely those in use in some other states; if the example of Nevada is valid, the change could significantly increase the number of minority candidates eligible for the colleges of education. Figures compiled by the Regents' staff in 1985 based on passing grades of two error units below standard (equivalent to the grades proposed in the recent legislation) estimated an overall pass rate of 79 percent.

The Legislature's failure to enact the new PPST pilot program leaves open the issue of how the colleges of education can attract more minority applicants. The universities' emphasis on undergraduate education and the implementation of proposals to set goals for recruitment, retention and graduation rates for minority students[2] will serve to increase slowly the pool of minority applicants, a first step in successful recruitment of teacher candidates. Strong remedial programs must be offered that will prepare students to pass the PPST examination, and communication must be strengthened so that students are made aware of these programs and of the entrance requirements of the education colleges, giving them sufficient time to prepare for the test.

Strong outreach programs must be established between the universities, the colleges of education and the community colleges.[3] Minority students tend to enter community colleges in greater proportions than enter the universities. These students must be given every advantage in transferring from the community colleges to the universities. This includes agreement between the institutions about the general education courses needed for university entrance, assurance that all students know they have the option to transfer to a university, and counseling to direct students to teacher preparation programs. Minority students must have access to strong programs that will prepare them to pass the university admissions tests and to be successful in their course work. The universities must accept responsibility for admission and retention of transfer students just as for native students; and strong financial aid and work programs must be in place.

Wisconsin has at present a pilot program in which community college students are

guaranteed admission to teacher education programs in selected institutions if they complete a specific general studies program.

A recent study from the National Governors' Association ("Recruiting Minority Classroom Teachers: A National Challenge") states that "...schools, colleges and departments of education might opt to devote greater resources toward preparing teacher candidates for exit, rather than screening out potential talent at entry. Multiple measures of achievement also might be used as screens for program entry....This could relegate standardized tests to a less central role in determining who has the opportunity to train to become teachers." Arizona's colleges of education are already devising multiple criteria for entrance that reduce dependence on the PPST scores. These include such areas as specialized experience and bilingual facility as well as grade point average and test scores. The strong remediation effort needed to prepare students for exit and certification must follow in order to prepare more minority candidates for teaching.

The Board of Regents might also convene a committee to consider revalidation of the PPST, given the range of scores in use in other states. Opinions on this option vary, however, among the deans of the colleges of education. In one case, such a move was applauded as a critical step, and in another there was little optimism that revalidation would serve a useful purpose, given the nature of the examination. The recruitment of minority teachers will remain a major issue for institutions and could become one of statewide concern. In anticipation of changes that will occur beginning in 1993 when the National Board for Professional Teaching Standards starts certifying teachers, the National Governors' Association has recommended that governors study their own state's teacher licensure regulations and teacher education programs, and examine whether minority students are entering the teaching profession.

Other Specific Needs

The Need for Teachers in Rural Arizona.

In reviewing the demand for teachers, two further critical issues concern the needs of rural Arizona and the shortages in specific academic disciplines, particularly bilingual and special education and mathematics and physical science. As noted earlier, education college graduates tend to remain and teach in the areas surrounding the universities. However, all of the Arizona's counties except two, Mohave and Yavapai, have higher percentages of children under five than Pima and Maricopa. Thus we find an adequate supply of teachers, in most disciplines, clustered in the metropolitan areas, while the percentages of the future school-aged population is greater outside. Creative ways must be found to recruit people from the outlying areas who will return to their homes to teach. Financial incentives such as forgivable loans or special bonuses might entice teachers into the rural regions. Funds should be made available to provide supervisory personnel for student-teaching assignments outside Pima and Maricopa Counties. Giving students an opportunity to live and work briefly in rural Arizona might entice them to resettle there. Where this is not possible, videotapes of rural accommodations and presentations from the rural districts could give students

some familiarity with areas outside the university communities.

This year the Arizona Legislature recognized the need for qualified teachers in specified geographic areas. House Bill #2108 established a Loan Forgiveness Incentive Program to encourage students to enter teacher preparation programs and to seek teaching positions in school districts in Arizona that have high proportions of economically disadvantaged and at-risk pupils. Two years of such full-time service to the state will negate a loan of $5,000. This is a laudable first step. The bill's rigorous reporting requirement will make it possible to assess the program's effectiveness. The Board must submit a report once each year that focuses on the effectiveness of the program in encouraging students to enter the teaching profession and to teach in a targeted school district. The loan program remains in effect through the 1993-94 academic year.

The establishment of the Arizona Telecommunications Cooperative[4] can provide positive educational benefits to the remote areas of the state that can help ease the effects of an insufficient number of teachers. Foreign languages, laboratory sciences and other basic courses can be offered through television and other electronic means to increase the subjects available without increasing the need for skilled staff.

The Need for Teachers in Specific Disciplines.

The shortage of teachers in specific disciplines must be viewed as a serious problem. There are already too many teachers in the school who have not had adequate preparation in mathematics and physical science. The National Science Board reports (1987) that only one in three elementary science teachers has had a college chemistry course and only one in five a college physics course. Further, more than one-half of all secondary school science teachers have never had a college course in computer science and almost one-half has had no college calculus. In 1986, about 25 percent of college freshmen planned to major in business, but only about two percent in physical science. In the same year, 30 percent of new physics bachelors in the U.S. went into manufacturing industries while seven percent chose high school teaching (American Council of Education). Other areas of need are bilingual and special education and elementary education. Arizona's small number of bilingual teachers are vigorously recruited for positions in other parts of the country. Our output of special education teachers is dropping. In Fall, 1984, approximately 160 students were serving apprenticeships in Arizona in special education; in Fall, 1987, there were approximately 100.

Increased emphasis on academic advising at the colleges of education would make students aware of the major fields of greatest need to help enhance their attractiveness to prospective employers. Efforts must be made to bring more students, especially minorities, into teaching in targeted areas.

Nationwide, in 1986 only one percent of grade 10-12 science and mathematics teachers were Hispanics; only one percent of the bachelor's degrees conferred in Physics in that year were to Hispanics and 3.7 percent were to Blacks. Cooperative university-wide efforts are needed to guide talented students with interests in mathematics

and science into teacher preparation.

The Telecommunications Cooperative will help here, also, in providing classwork electronically in disciplines where no teacher is available.

Alternate Routes to Certification

Currently five institutions in Arizona have approved teacher training programs: University of Arizona, Arizona State University, Northern Arizona University, Grand Canyon University and Southwestern Baptist Bible College. The last two are private institutions. None of these schools is planning to significantly increase the size of its education college; slight enrollment increases may take place at NAU and Grand Canyon. Southwestern has a small program of 20 to 25 students, most of whom leave to teach outside Arizona. Thus, the proportion of in-state trained teachers is not likely to change. Are there sources of new teachers outside the formal route of the education colleges?

Post-Baccalaureate Programs.

The public universities point to their post-baccalaureate programs as viable alternatives to a formal education program for those who have the B.S. or B.A. degree in a noneducation field. In these programs, candidates who would like to teach in the area of their degree can take courses in subjects such as teaching methods, child development and classroom management and do nine weeks of traditional practice teaching in preparation for certification. Enrollment in these programs has increased, with some indication of a slight rising trend in people who are changing careers in favor of teaching. Potential teachers who live in an area served by the universities can often pursue certification through the post-baccalaureate route while still working at their current jobs, but a drawback for other candidates would be that they would have to stop working at least during the full-time nine-week internship period. For those who would also have to move to where the courses are accessible, this could mean a long period of unemployment, a course not everyone might be able to follow. Thus, for people in the easily accessible university areas, who are able to leave their present jobs for nine weeks, post-baccalaureate study is a feasible approach to a teaching career and should be encouraged. It is a sound way to bring into teaching those people with degrees who lack courses in teaching methods and classroom experience.

The colleges might also design a post-baccalaureate program to attract degreed minority candidates into teaching. Such a program would need a strong financial aid component.

To continue to attract this vital group into the teaching programs, the universities and the education colleges must recognize a status for them in the system which provides some student privileges beyond those of beginning undergraduates.

The use of electronic means to provide courses for the post-baccalaureate candidates is both applauded and viewed with caution. The availability of coursework at times and places convenient to the applicant could enhance the program for many people. But there is some skepticism about the use of high technology to prepare people to deal directly with other people. Here the course offerings would have to be selective, dealing with basic skills and other in-service needs, with careful

supervision provided for other courses.

Alternate Certification.

A new alternate credentialing program has been adopted by the State Board of Education that can provide more teachers for grades 7-12. Under this program, a candidate with a bachelor's degree can be hired by a school district to teach those courses in which he or she has either a major or 30 hours of study, a passing grade on a state-administered test in that subject, and a passing grade on the teacher proficiency exam. The candidate must also take 160 hours of instruction in subjects such as teaching methods, child development and classroom management. These courses can be taken in the summer before the teaching assignment begins or in evening classes during the school year. A provisional certificate will be issued for one year; this year will be a training period during which the new teacher will be closely supervised by an experienced teacher.

This route gives a candidate a regular position while being trained as a teacher, eliminating the potential financial drawback of the post-baccalaureate course. It is a more accessible route for those who live far outside the university areas, particularly if some of the course work is available via television and other electronic means. Details about the program must still be defined. The tests that will be used to determine subject knowledge, a system for monitoring standards in the school districts and the level of supervision and training that is available will be vital elements in the success of the program. A recent study of the alternate route of certification in effect in New Jersey since 1985 found the program to be "a notable success," but one conclusion is troubling. The report criticized the training and supervision that alternate route candidates receive prior to certification. In Arizona, the school districts and the universities should be encouraged to work closely together to establish the standards and training that will be used. The alternate certification program could be used to attract a variety of people into teaching. In Maryland, training programs have been established at two military bases for personnel nearing retirement; they are ready, then, to take their certification tests when they retire. Retired businessmen, scientists and engineers are potential candidates for K-12 teaching if a reasonable means to achieve certification is available. The success of the post-baccalaureate programs has proved that there is a growing body of people who seek career changes and look to teaching as a viable alternative.

It should be noted that in other parts of the country school districts are becoming quite aggressive in seeking new teachers. In Brookline, MA, prospective teachers with B.A. or B.S. degrees are hired by the school district and trained completely within the district, including the methods component.

Efforts might also be made in Arizona to recruit those graduates of teacher education programs who either never went into teaching or left the field, on the chance that they have some renewed interest. These are people whose training could put them back into the classroom quickly.

If the colleges of education do not enlarge their classes, alternate means to attract people into teaching must be encouraged. A predicted slowdown in in-migration and aggressive competition from other sunbelt states will decrease

the numbers of new teachers from other areas. Efforts to recruit minorities into teaching must be redoubled. The latest figures from the Western Interstate Commission on Higher Education show that the growth in high school-aged students through 2004 will be greater in the West, and more students will be ethnic minorities. For Arizona the projection is for a leap from 31,876 high school graduates in 1987-88 to 50,910 in 2003-04. As today's teachers reach retirement age, replacements will be needed in the schools and, to match the makeup of the student body, a greater number of minority teachers will be needed. A plan to assure a sufficient number of adequately qualified teachers for the K-12 system must be in place with a commitment to implementation.

Data Needs

In devising such a plan, it is essential that appropriate records are available. A statewide data system should be developed and maintained that can be used to forecast teacher attrition. Such data are important because the success or failure of many education reforms will rely heavily on actual or potential imbalance in supply of teachers. A shortage will inhibit attempts to increase the competency of teachers; more emergency credentials will be issued with less attention to the quality of the candidates. On the other hand, an oversupply of teachers will hinder movement toward the professionalism of teachers. Thus, longitudinal studies to predict trends in supply and demand are essential.

PROFESSIONAL EDUCATION OF TEACHERS IN ARIZONA

Two previous task forces have studied the quality of Arizona's educational system. One of the recommendations of the 1983 report of the Governor's Committee on Quality Education (Education in Arizona: Popular Concerns, Unpopular Choices) was that a task force be appointed to re-examine the manner in which teachers are trained. That group, the Governor's Task Force on Teacher Education, prepared a report in 1984 entitled, Teacher Education in Arizona: Evolution or Revolution. Both groups were headed by Dr. John P. Schaefer.

Four years later, unfulfilled recommendations made by the Task Force on Teacher Education are still pertinent, as are recommendations made by the various national reform commissions. The concern for the quality of the teachers is just as strong today and questions about the appropriate means to provide professional education have not been answered.

Statistics have been widely dispersed to show that the best qualified students are not going into education programs in the same proportion as seek other fields. With the opening of many other career paths to women and minorities, the education colleges have been attracting students with lower SAT scores and, with greater frequency, those from vocational and general high school tracks rather than academic. This trend is reversing, however, and there is renewed interest in teaching among top-flight students. The pass rates cited earlier for the 1986 ATPE examination have raised questions about the quality of the graduates of the Arizona colleges. The percentages of students who passed, by institution,

were:

ASU	78.6
UA	80.1
NAU	68.9
Grand Canyon	74.8
Southwestern Baptist	100.0
Other Arizona	78.4

If Arizona were under the same mandate as Florida, where the Department of Education is required to review teacher education programs, over a three-year period, at colleges and universities in which fewer than 80 percent of the institution's graduates pass the state's teacher certification examination, all of the institutions except Southwestern Baptist and (very marginally) UA might have come under study.

To encourage the best students to become teachers, the enhancement of K-12 teaching as a career must become a serious target. Recommendations of various national commissions include toughening certification standards, increasing salaries and improving working conditions. Others are to develop "lead teachers," eliminate undergraduate programs in teacher education, develop new graduate school programs leading to master's degrees in teaching, create a National Board for Professional Teaching Standards, restructure K-12 schools to allow teachers greater discretion in achieving state and local goals, increase teacher accountability for student performance and increase efforts to recruit minority teachers. Many of these recommendations were included also in the report of the Arizona Task Force on Teacher Education.

The average teacher's salary today in the U.S. is $28,031. Arizona ranks twenty-fourth among the states with an average salary of $27,388. Inequality within districts points up the differences between advantaged and disadvantaged areas. For example, in Pima County averages range from $23,034 in Vail to $31,822 in Tucson Unified School District. The average starting salary in Pima County is now almost $20,000, and this may make teaching a more attractive career choice, but salary ranges for experienced teachers will have to rise to keep people in the classroom past their first few years. It has been suggested that this issue will require a special session of the legislature to deal exclusively with budgeting of schools.

The Five-Year Education Program

The question of the four- versus five-year education program is being debated nationally, but none of the Arizona institutions plans to move to the five-year program. This entails a four-year liberal arts curriculum and a fifth year of study in the theory and practice of teaching and practical study leading to certification. Such a program is seen locally as a deterrent to attracting better-qualified candidates in that it delays for a year entrance into a paying position with little promise of adequate financial return. Its negative impact might be heaviest on minorities. All of the institutions feel that they are able to provide, within a four-year track, adequate academic preparation and classroom teaching experience. Their efforts are being directed toward strengthening the four-year experience.

The make-up of the five-year plan is appealing in that it provides adequate time both for an intensive academic program and for study in the theory and practice of teaching. Recognizing that students may not be willing or able to spend an extra year in training, a plan should be developed whereby students complete the fifth year of the program as

apprentice teachers while employed in a regular position in the school district. During this year the apprentice teacher would have a provisional certificate and would work under the lead of a master teacher, so designated by the local school. Regular assessment measurements must be in place to determine whether the novice teacher is progressing adequately in mastering the skills of teaching. If the apprentice has performed according to the standards, at the end of the year he/she would be awarded full certification. In this way, the new teacher is training and working, gaining on-the-job experience from an experienced, superior teacher. This apprentice year should be designed jointly by the education college and the local school district, and the student should receive additional training at the university in areas in which he/she may be weak. There is not sufficient experience with or data collected about the five-year program for it to have garnered much support in Arizona. The question remains whether after five years of training a teacher is better prepared to enter the classroom.

Several states mandate that the universities be responsible for additional training for any student who does not meet the standard requirements at the end of the first year. Grand Canyon University guarantees assistance to any teacher graduate, at no expense to the school district or to the graduate, who is experiencing difficulty in the first year of teaching.

This five-year program would be valuable in orienting teachers into the classrooms. Although education students work in the school districts observing and doing practice teaching for various periods during their training and the colleges of education have in place assessment programs to determine skill acquisition, most teachers must assume full responsibility for a classroom on their first teaching job. Other than through retirement, the greatest attrition of teachers is in the first year of teaching. Induction programs are needed to help teachers successfully survive that period. There must be financial incentives to those designated as master teachers and this must be viewed as a vital and respected role for an experienced teacher.

The issuance of a provisionary certificate to the new teacher could become the basis for introduction of a tiered system of certification, withholding full certification until a teacher has successfully passed designated performance standards, and adding a category for those attaining master teacher status. Provisional certificates would be effective for up to two years, and could be renewed if it was determined that the teacher was moving adequately toward full certification. The standards for each step in certification should include additional teaching experience and continuing education in areas that enhance the teacher's knowledge of subject matter and classroom skills; attainment of a master's degree would be a further step. The education colleges should be responsible for offering rigorous, challenging graduate courses.

For teaching to be perceived publicly as a profession, this distinction between beginning and experienced teachers is important. Appropriate salary rewards should follow each step. As noted earlier, the beginning salaries of teachers are rising and becoming more competitive, but the gap is closed in mid-career, reducing incentives to continue to grow professionally.

Full certification and certification as a Master Teacher, under this tiered plan, would be renewable every five years, and for renewal it would be necessary to demonstrate experiential and educational advances.

Long-term studies must be initiated to measure the results of different routes to teaching before a new approach to certification can gain acceptance. Measurements must be developed to determine whether teachers with four years of liberal arts training and one year of carefully supervised apprentice teaching have different results with student attainment than those teachers who complete conventional four-year programs.

As noted earlier, the National Board for Professional Teaching Standards will start certifying teachers in 1993. Such a board was a recommendation of the Carnegie Forum's report entitled, A Nation Prepared: Teachers for the 21st Century, and Carnegie has funded its establishment. (Carnegie spearheaded the movement to strengthen medicine nearly 100 years ago through national medical board certification and examinations.) Certification by the National Board will be voluntary for teachers. The recommendations issued by the National Governors' Association urge the states to begin now the debate over what type of rigorous teaching standards would gain national recognition and enhance the profession. Arizona's review of its state-level standards should include ways to link teacher certification with teacher assessment.

Pilot Programs

Before new programs can be recommended for implementation, pilot programs should be developed to carefully study and test areas such as beginning teacher induction, teaching internships as fifth-year programs, and a multi-tiered certification system. We recommend that such programs be initiated by the ASU-West Faculty of Education and Human Services. The colleges of education at UA and ASU are grappling, at present, with managing their enrollments at appropriate levels, experimenting with new multiple-criteria entrance requirements, and implementing curricular changes. The faculty must maintain their classroom and clinical lab activities while fulfilling the urgent need for research on teaching and teacher preparation; they must be at the forefront of the expanding knowledge base for teaching expected of colleges of education. Some of these pilot programs could appropriately be initiated at NAU since their outreach is statewide, although their main campus location outside a major metropolitan center might make the results less applicable in other regions. We find the most appropriate vehicle for such experimental pilot programs in preparation and delivery of teacher services, given its site, still-small size and cooperative programs with five community colleges, to be the ASU-West facility.

Additional Classroom Training

While studies are underway to assess the training time spent in the classroom, the universities need to look at ways to increase early classroom exposure for their students. At NAU, resident students can begin as early as their freshman year to visit classrooms in Flagstaff. They keep logs of what is happening and observe what a teacher does. The other schools need to devise some way for a student who plans to declare as an education major or who

needs to learn more about the field to be part of a classroom setting. From this, students could build on their experiences; their formal observation and practice teaching assignments as education majors would be more meaningful and more valuable. This would aid also in determining those students who may not be suited for teaching who should be encouraged early to prepare for another career.

Need for Working Partnerships

An important issue of concern in the professional education of teachers involves strong partnerships between the universities, the K-12 system, the community colleges and the business community. Unless these entities are working collaboratively, the results will not be fully beneficial. Arizona's widespread community college system provides from 50 to 70 percent of the students in the education programs at the universities. Strong articulation efforts must be maintained to assure that the community college students are being adequately prepared for the universities' programs. Much of the responsibility for preparing students sufficiently to pass the PPST examinations rests with the community colleges.

A step in articulation with the community colleges should involve their working with the K-12 system to provide classroom experience for their students who intend to transfer to an education program. Even though this would come before any formal education courses have been taken, the student would observe what teaching is and could gain a better perspective of what he/she will face.

Another area in which the community colleges could work collaboratively with the schools is that of supervising practice teachers. (This was a recommendation also of the Governor's Task Force on Teacher Education.) Again, the outreach of ASU-West with five community colleges makes this another suitable study to be developed and carried out there. Studies show that the university professor with whom a student has worked is less involved with the student in the practice teaching experience. This leads the student in the direction of the classroom teacher and that student then learns how to to teach according to standards already in place rather than according to new knowledge being developed. The practice teaching period is vital and careful programs and supervision must be developed cooperatively between the universities, the community colleges and the school districts to ensure that the most up-to-date research on teaching finds its way into the K-12 classrooms.

This issue was discussed in the 1984 report issued by the Governor's Task Force on Teacher Education:

"A further task the colleges of education must deal with more effectively is converting valid and useful research findings on teaching and learning into new classroom techniques. There are few effective mechanisms at the present time for sharing new approaches with practicing classroom teachers, and student teachers often have little opportunity to apply new theory in their practice teaching. The consequences of this failing is that the money spent to fund research is ultimately wasted, and outmoded and inadequate approaches to teaching are needlessly continued."

Strong partnerships must be forged with the K-12 system and the community colleges involving teacher exchange, dissemination of information about the requirements and needs of the universities so that teachers and students are fully aware of the preparation necessary, and outreach toward identifying and developing those students who show an interest in pursuing a career in education. The program in the Department of Mathematics at UA that brings area high school teachers to the university for a year of teaching and study is an excellent example of outreach and cooperation, beneficial in the short-term to the individuals involved and in the long-term to their students, their districts and ultimately to the university. Such programs should be coordinated cooperatively with the colleges of education.

At NAU, teachers from the Flagstaff schools spend time on campus, working with student teachers. The Teacher of the Year joins the NAU faculty for a period of time. During the summer sessions, experts in education are brought to the campus to work with returning teachers.

Another partnership that has been proposed revolves around the need to introduce a multicultural aspect into the schools. The universities and the school districts should work together to devise ways to accomplish this. The need exists both in training teachers at the start and in re-training experienced teachers. For students the need is for an integration of information about different cultures into all courses on teacher training, not only in a specific course on multicultural issues. Thus, these issues would not be contained only in a course for bilingual teachers, but in courses that all students take, such as methodology and theory. The students need help in learning how to bring about minority parent involvement and how to make it work.

Such programs are needed, too, for experienced teachers, to give them more knowledge about different cultures. They could be made part of the continuing education requirements for teachers, or the universities could develop re-training programs to present in the school districts.

The business community of Arizona can also play an important role in helping the schools identify and assist talented prospective teachers. It is not uncommon for businesses, especially those seeking a wider pool of minority engineers, to select promising high school students to foster. These students are encouraged through provision of summer jobs, internships and cooperative work programs to stay in school and prepare for graduation and entrance to the universities. In return, the trained specialist will work for the sponsor following university graduation. Industry has indicated a need for a strong, well-respected school system to attract new employees and should be willing to participate in similar programs to foster and support promising students who will become teachers. Although they will not gain new employees through such programs, they will have added to the enhancements they can offer their prospective employees.

Other means must be used also to reach students, both majority and minority, in junior and senior high school, to encourage them to become teachers. These students will need careful supervision and help to ensure their completing high school with the skills

necessary to gain entrance to the university and a continued drive to become teachers. Ways to involve them in teaching situations, either in their own high schools or in cooperation with other schools, will be necessary. This collaboration between the colleges of education and the high schools is vital.

Improving the teacher education programs in the universities is not the role of the colleges of education alone. The task is so tied to the programs of the arts and sciences and other colleges across the universities that an expanded level of commitment and cooperation must be built and maintained. The premise that teachers must be liberally educated goes far beyond the arts and sciences' faculty working with the education faculty to develop programs for education majors. The influence of their teaching is strongly felt. Every classroom experience a prospective teacher has must enforce the model of good teaching; every lecture must instill in the student the standards of good teaching. Arts and sciences' faculty must be willing to work with education faculty to determine the nature of the knowledge base required for teaching in various areas, and must ensure that quality courses are available for developing that knowledge base. It is not appropriate for a mathematics professor to judge that the incoming students are poorly prepared in math because they were not adequately taught in K-12 by teachers who were not properly prepared in the colleges of education; the K-12 teachers received their training in mathematics not in the education colleges, but in the math departments. The responsibility for preparing professional teachers is shared throughout the university.

The universities and the state must be strongly committed to the need for sufficient well-qualified teachers for Arizona's public school system. A nine-year summary (FY81-FY89)[5] of the program change requests ("decision packages") approved by the universities and forwarded to the Board reveals that the lowest dollar emphasis has been on education (as a college) and public service. Four decision packages were sent forth during this period, from UA in FY83 and FY88, from NAU in FY86 and from ASU in FY89. Of these, only the NAU request was funded, reduced from $500,000 to $400,000.

Strong cooperation among the universities, colleges of education, community colleges and K-12 schools can lead to a greater supply of successful teacher candidates and a renewed confidence in the quality of Arizona's teachers. As our student population grows, the quantity and quality of K-12 teachers will remain an issue of greatest importance to the welfare of the state.

CONCLUSIONS

Arizona will have a continuing demand for teachers throughout the next decade if the current teacher-student ratio is maintained.

Arizona's institutions of teacher preparation will continue to produce less than 50 percent of the state's new teachers.

The composition of the student body will change significantly.

The composition of the teachers in the labor pool will not match the ethnicity of the projected school population.

Experimentation and research on teaching and teacher preparation are needed.

Substantive measures of teaching skill are needed for the development of reliable teacher assessment.

RECOMMENDATIONS

- Develop and maintain a statewide data system that can be used to forecast teacher supply and demand figures and can be the basis for long-term study on teacher attrition. This system should include race and ethnicity of the current and projected teaching force.

- Develop a program to recruit minorities into the teaching profession. The program should address: financial incentives (including forgivable loans); social and academic support; the effect of the basic skills testing requirement on minority enrollment.

- Develop pilot programs in the following areas:

  Beginning teacher induction;

  A multi-tiered certification system;

  K-12/community college/university partnerships;

  Teaching internships as fifth-year programs;

  University/College of Education partnerships;

  Delivery of education in remote areas;

  Using community college personnel to supervise practice teachers.

- Encourage research, data collection and dissemination, and program evaluation relative to teacher education.

- Develop standards that make the colleges of education accountable for the performances of their graduates.

- Recognize the programs and faculty of the Colleges of Education as important contributors to the university as a whole.

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ENDNOTES

1. The breakdown of teachers is: 89 percent White, 2 percent Black, 7 percent Hispanic, 1 percent American Indian, .5 percent Asian.

2. See especially Working Papers entitled, "Minority Education in Arizona's Universities," (J. Wood) and "Undergraduate Literacy Programs at Arizona's Universities," (K. Church).

3. See Working Paper entitled "Community College-University Articulation in Arizona," (R. MacVicar) and The Chronicle of Higher Education, July 27, 1988, p.A28.

4. See Working Paper entitled, "Opportunities for Telecommunication for University Outreach in Arizona," (R. MacVicar).

5. See Working Paper entitled, "Arizona Universities Program Changes Nine Year Summary:FY1981-FY1989," (R. Caldwell).